

CLAIMS

What is claimed is:

1. A method for transitioning a target from a missile warning system to a fine tracking system in a directional countermeasures system, the
5 method comprising:
capturing at least one lower-resolution image within a field of view of the missile warning system;
identifying a threat from the captured lower-resolution image or
images;
10 identifying features surrounding the threat from a captured lower-resolution image utilized in identifying the threat;
capturing a higher-resolution image within a field of view of the fine tracking system; and
identifying a location of a threat within this captured higher-
15 resolution image as a function of the identified features.
2. The method of claim 1 wherein the operations of capturing at least one lower-resolution image and capturing a higher-resolution image include sensing infrared radiation emitted from the threat.
3. The method of claim 1 wherein identifying the threat from the
20 captured lower-resolution image or images comprises processing a sequence of captured lower-resolution images to identify the threat.
4. The method of claim 1 wherein identifying features surrounding the threat from a captured lower-resolution image utilized in identifying the threat includes registering the features to thereby define the
25 position of each of the features relative to the threat.
5. The method of claim 4 wherein the method further comprises:

determining a contrast between the threat and a background portion of the lower-resolution image; and

when the contrast is greater than a threshold level, identifying a location of a threat within the captured higher-resolution image without the use of the identified features.

6. The method of claim 1 wherein the method further includes performing countermeasures on the threat identified within the captured higher-resolution image.

7. The method of claim 6 wherein performing countermeasures includes illuminating the threat with modulated infrared radiation.

8. The method of claim 1 wherein identifying features surrounding the threat from a captured lower-resolution image utilized in identifying the threat comprises analyzing a subimage of the captured lower-resolution image that includes the threat.

9. A method for identifying threats, comprising:
capturing at least one low-resolution image within a wide field of view;
identifying a threat from the captured low-resolution image or images;
identifying features surrounding the threat;
registering these features with the threat; and
capturing a high-resolution image within a narrow field of view;

identifying a location of a threat within this captured high-resolution image using the registered features.

10. The method of claim 9 wherein the operations of capturing at least one low-resolution image and capturing a high-resolution image include sensing infrared or ultraviolet radiation emitted from the threat.

11. The method of claim 9 wherein identifying the threat from the
5 captured low-resolution image or images comprises processing a sequence of captured low-resolution images to identify the threat.

12. The method of claim 9 wherein identifying a threat from the captured low-resolution image or images comprises analyzing a subimage of the captured lower-resolution image, with the subimage including the threat.

10 13. The method of claim 12 wherein the method further comprises:
determining a contrast between the threat and a background portion of the subimage; and
when the contrast is greater than a threshold level, identifying a
15 location of the threat within the captured high-resolution image without the use of the registered features.

14. The method of claim 9 wherein the method further includes performing countermeasures on the threat identified within the captured high-resolution image.

20 15. The method of claim 14 wherein performing countermeasures includes illuminating the threat with modulated infrared radiation.

16. A directional countermeasures system, comprising:
a missile warning subsystem operable to capture lower-resolution
25 images within a wide field of view and to identify a threat within the wide field of

view from the captured images, and to provide a subimage contained in a most recent one of these captured images, the subimage containing the threat;

5 a fine tracking subsystem operable to capture higher-resolution images within a narrow field of view and to track and perform countermeasures on a threat identified in the captured higher-resolution images; and

a handoff tracker processing subsystem coupled to the missile warning and fine tracking subsystems, the handoff tracker processing subsystem operable to receive the subimage containing the identified threat from the missile warning system and operable to process the subimage to determine features in
10 the subimage and to define the position of these features relative to the position of the threat, and from these determined features being further operable provide information to the fine tracking subsystem for use in tracking the threat.

17. The system of claim 16 wherein the handoff tracker processing subsystem processes the subimage by making a determination of the clutter and contrast of the threat within this subimage and only determines
15 features when the determination of the clutter and contrast indicates the there is low contrast or high clutter of the threat in the subimage.

18. The directional countermeasures system of claim 16 wherein the handoff tracker processing subsystem is contained in the fine tracking
20 subsystem.

19. The directional countermeasures system of claim 16 wherein both the missile warning and fine tracking subsystems include infrared sensors for capturing their respective images.

20. The directional countermeasures system of claim 300
25 wherein the fine tracking subsystem includes an infrared laser component for use in performing countermeasures by illuminating the threat with modulated infrared radiation.